in a thousand cocoa-nuts on the average displays this strange peculiarity. The formation of the latter is always a remarkable phenomenon, hard to account for, from the water in the nuts generally lacking the chemical substances favouring abnormal growth of the kind. Rumphius states for a fact that cocoa-nuts from Macassar yield more pearls than those from other places. This scientist, in 1682, sent, as a present to the Grand Duke of Tuscany, a ring in which a cocoa-nut pearl had been set. Similar pearl-like formations are met with in other East Indian fruits, such as the waringin, the pomegranate, and the kechubong."

To this may be conveniently added two brief extracts from the long and admirable account given by Rumphius:—

" *Calappites*, Belgis *Calappus-Steen*, Malaicensibus *Mestica Calappa*, albus est lapillus instar marmoris seu silicis albi, durus, planus, ac glaber, cujus putaveram alio loco inter lapides ac mineras descriptionem dedisse, quum vero in *Calappa nuce* inveniatur, ac sollicitus sim, opus illud a me forte non absolutum iri, animo induxi hic loci ejus exhibere descriptionem. Est itaque albus ac politus, seu glaber lapillus in interiore *Calappæ nucis* parte concrescens, nunc putamini fixus, nunc vero media in lympha natans, diversæ ac duplicis potissimum formæ" (Rumphius, " Herbarium Amboinense," vol. i. pp. 21, 22).

" Incolæ plurimum omnes *Mesticas* amant, quarum quasdam tanti æstimant, ut optimis etiam præferant gemmis; plurimas enim ipsis tribuunt immo sine dubio superstitiosas etiam virtutes, gestant enim has ad nudum corpus, in annulis, et armis, ad prosperum conatuum successum obtinendum. Elegantissimos ac rotundissimos hujus Calappi lapillos, seu *Calappites* imponunt annulis suis, vel etiam telis adpendent, non auro, sed argento circumdatos, dicentes melius hoc cum natura *Calappites* convenire" (p. 22).

If Dr. Hickson would present one of his pearls to the Kew Museum, it would, I am sure, interest a great many persons who would be glad to see an authentic specimen of so interesting a curiosity.

## *NOTES.*

THE Annual Meeting of the Royal Society for the election of Fellows was held at the Society's rooms in Burlington House on Thursday last, when the following gentlemen were elected into the Society: John Young Buchanan, M.A., John Theodore Cash, M.D., Sir James Nicholas Douglass, M.I.C.E., Prof. James Alfred Ewing, B.Sc., Prof. George Forbes, M.A., William Richard Gowers, M.D., Prof. Alexander B. W. Kennedy, M.I.C.E., George King, M.B., Sir John Kirk, M.D., Prof. Oliver Joseph Lodge, D.Sc., Prof. John Milne, F.G.S., Rev. Octavius Pickard-Cambridge, M.A., George James Snelus, F.C.S., Thomas, Lord Walsingham, William Whitaker, B.A.

THE Council of the London Mathematical Society have awarded the second De Morgan medal to Prof. Sylvester, F.R.S., for his numerous and brilliant contributions to pure mathematics. The medal will be presented at the Council meeting in November next.

THE preparations for the forthcoming meeting of the British Association in Manchester are progressing very favourably. A strong Local Committee has been formed, and a guarantee fund of over £10,000 has been raised to meet the necessary local expenses. The reception-room will be in the recently-built Natural History Museum of the Owens College, and the Section rooms in the College or its immediate neighbourhood. A prominent feature of the meeting will be the presence of a large number of eminent foreign men of science, of whom more than a hundred have already accepted invitations to attend.

ARRANGEMENTS for the dinner to Prof. Tyndall are progressing satisfactorily under the direction of the Executive Committee consisting of Prof. Stokes (Chairman), Sir F. Abel, Sir W. Bowman, Sir F. Bramwell, Dr. Evans, Prof. Frankland, Dr. Hirst, Prof. Huxley, and Sir Henry Roscoe. Circulars announcing the dinner have been largely issued. It is, however, for obvious reasons impossible to send notices to all those who might wish to attend, and applications for tickets are daily made by gentlemen who have received no special notification of the event. There is no doubt that a body of scientific men will meet at the dinner such as has seldom or never been brought together on a similar occasion. Nor will the gathering be confined to scientific men alone. Among others, the following have also expressed their intention of being present: Lord Derby, Lord Lytton, Earl Bathurst, Sir F. Pollock, Sir F. Leighton, Lieut.-General Smyth, Prof. Bonamy Price, and Messrs. Leslie Stephen, W. Lecky, and Wemyss Reid.

THE Ladies' *Soirée* at the Royal Society, as we stated last week, was largely attended. Careful preparations had been made for it, and it was a great success. At intervals, in the Principal Library, a cornet solo was telephoned from Brighton. A large number of objects of great scientific interest were exhibited. Photographs of clouds, and photographs of the Firth of Forth Bridge, were shown with the lime-light; the former with demonstrations by the Hon. Ralph Abercromby, the latter with demonstrations by Mr. Baker. The microscopic structure of pearls was also shown with the lime-light, by Dr. George Harley. The Zoological Society of London exhibited a fine living specimen of the electric eel, from which shocks were taken. Prof. A. W. Rücker exhibited—(1) Colours of soap-films rotating under the influence of an air-current. A jet of air is directed on to the film so as to form a vortex, the colours of which change as the film becomes thinner. This experiment is due to Sir David Brewster. Attention has been recently called to it by Lord Rayleigh. (2) Artificial imitation of the colours of the setting sun. Light is passed through a glass cell containing a solution of sodium hyposulphite. If a little hydrochloric acid is added, the sulphur is deposited in fine particles which scatter the blue end of the spectrum. The transmitted light becomes redder, and colours like those of sunset are produced. This experiment is due to Capt. Abney. (3) Apparatus to illustrate the passage of light through lenses. An application on a large scale of the method of tracing the rays by passing them through air in a closed space charged with a small quantity of smoke. Chrysalides and living larvæ showing the influence of surroundings upon their colours were exhibited by Mr. E. B. Poulton; and Dr. E. Klein exhibited the following specimens of microbes under the microscope and in cultivation:—*Bacillus anthracis; Bacillus tuberculosis;* Bacillus of leprosy; Bacillus of swine fever; Bacillus of septicæmia; Bacillus found in typhoid fever; Spirillum found in Asiatic cholera; several other species of Spirilla; several species of *Bacterium termo;* Micrococcus of foot-and-mouth disease; Micrococcus of scarlet fever; Micrococcus of vaccine; different species of coloured microbes. Mr. Chichester A. Bell showed apparatus for reproducing audibly the vibrations of liquid jets. Vibratory motions of the orifice from which a liquid jet escapes, give rise to slight swellings, and constrictions of the liquid column. The swellings increase and the constrictions diminish as the jet travels downwards, finally causing it to break into drops. When the jet strikes upon a flat surface, the swellings are continued as waves in the thin sheet of liquid, which spreads out from the point of impact. The jet liquid being a conductor of electricity (acidulated water), and two platinum electrodes in circuit with a battery, and a telephone being immersed in the liquid sheet or nappe, the jet vibrations are reproduced as sound in the telephone.

A DEPUTATION consisting of Mr. Mundella, Mr. Joseph Chamberlain, Sir John Lubbock, Sir Henry Roscoe, Sir Lyon Playfair, Mr. John Morley, and others, will wait upon the Chancellor of the Exchequer on the 30th inst. to urge the claims of University Colleges upon the Government. Mr. Goschen has always taken so deep an interest in questions connected with education that he may be expected to consider carefully the arguments which will be submitted to him. It is almost certain that unless the University Colleges receive aid from the State some of them will have to be closed, for it has never been found that institutions of this kind can be maintained by fees alone. All that is asked is that the nation shall do for the University Colleges of England what is already done for like institutions in Wales, and for the Universities of Scotland.

THE foundation-stone of the new College of Science at Newcastle-upon-Tyne was laid yesterday by Sir William Armstrong.

THE Rev. J. E. Leefe has presented his botanical collections to Kew. Since the death of Borrer in 1862, Mr. Leefe has been universally recognized as the principal authority on British willows. In early life he lived in Essex and Yorkshire, but for the last generation he has held the living of Cresswell on the coast of Northumberland, opposite Morpeth. Here he got together a very fine collection of living willows, which had been obtained from Borrer, Darwall, the Duke of Bedford's collection at Woburn, and the Botanic Gardens of Kew and Cambridge. His sight having failed, he has retired to live at Coatham, near Redcar, and has given to Kew the collections he is no longer able to use. His principal publication was issued in 1842 under the title of "Salictum Britannicum." This contains ninety specimens, with printed tickets, and has been the recognized standard, ever since its publication, by which British willows have been named. His principal published papers are in the *Journal of Botany* for 1871—one entitled "An Arrangement of the British Willows," and another "On Hybridity in Salix, and the Growth of Willows from Seed." The collection he has now presented contains his own copy of the "Salictum," accompanied by a quarto manuscript; a valuable set of types from Hoch, the author of the classical "Flora Germanica"; a great many specimens dried from his living collection at Cresswell; and American types received from his correspondents in the United States. The general herbarium is of a miscellaneous character, principally British, but containing also a number of plants from Central Europe, Abyssinia, America, and other parts of the world. Amongst the British plants, the collection contains a curious *Ammophila*, gathered near Cresswell in 1872, with the glumes of ordinary *A. arenaria*, but with the decidedly tropical inflorescence of *A. baltica*, for which one of the only two known British stations is in Ross links, also on the Northumbrian coast, and which has by some botanists been regarded as a hybrid between *A. arenaria* and a *Calamagrostis*.

*Apropos* of our note last week on the invitations to the ceremony at Westminster Abbey, a correspondent writes to us from Dublin:—"We have the same state of things here. Neither the President of the Royal Irish Academy, nor the President of the Royal Dublin Society, as such, have got invitations. Invitations have been sent lavishly to Mayors, all of whom, save in three cases, have refused them, thus leaving, as one would have thought, a chance for science coming No. 2."

IN a despatch received at New York from Mexico on the 12th inst. it was announced that shocks of earthquake had been felt throughout Guerrero State on the 29th ult. and on the 1st and 2nd inst., and that several of the smaller towns had been injured.

SEVERE shocks of earthquake were felt last week in some parts of Turkestan. At Vernoje they began about 5 o'clock on the morning of the 9th inst. Almost all the buildings in the town were destroyed, and much life was lost. Great damage was also done at Kashelensk, Tsharkent, and other places. The telegraph line in the neighbourhood of Vernoje was broken down for a distance of about 200 versts.

THE last number of the *Annuaire de la Société Météorologique de France* (February, 1887) contains an interesting article by M. Hervé-Mangon on the distribution of rainfall and its duration in Paris, from observations taken during the years 1860-70. These observations, which were made with Hervé-Mangon's pluvioscope, show that rain falls on an average 19 hours a month. The month with the shortest duration of rain was August, which had only 12½ hours, while March had 26, and October and November a little more than 22 hours each. An examination of the hours of the rainfall during the night and during the day shows that on an average there are fewer hours of rain during the night than during the day. The longest interval without rain was 26 days, from September 11 to October 6, 1865. The greatest number of consecutive days of rain was 18, from October 3 to 20, 1867. The month of March had, on an average, the greatest number of rainy days, viz. 21·2, and the month of June the least, viz. 13·1. The months of greatest and least amount of rainfall do not correspond with these months, the maximum being 2·21 inches in September, and the minimum 1·00 inch in February.

THE *Monatsbericht der Deutschen Seewarte* for the whole year 1886 has been issued simultaneously with the Report for January 1887. The delay in the issue of the Reports is owing to some important alterations in the form of the work, especially the extension, considerably to the west, of the chart showing barometric minima. The above Report takes the place of the *Monatliche Uebersicht der Witterung*, which completed its tenth volume with the year 1885. It is proposed to issue it regularly in the third month after that to which it refers, and to include in it (1) a review of the atmospheric conditions over Central Europe, (2) preliminary communications respecting the weather in the North Atlantic, and (3) meteorological tables for Europe generally, and charts of the paths of the barometric minima over ocean and continent. This monthly report will be supplemented by a more complete quarterly review of the weather, which will appear after a lapse of about two years, and will serve as the explanatory text of the daily synoptic charts for the North Atlantic Ocean and adjacent continents lately referred to (May 26, p. 88). This text will be issued separately by the German Admiralty, and will be of great value to all interested in meteorological investigations.

FROM a recent report by Dr. Hellmann on statistics of lightning-damage in Schleswig-Holstein, Baden, and Hesse, it appears that the danger from lightning in these parts (unlike the case of other parts of Germany) has been decreasing of late years. Soft-roofed houses are fired about 7 times oftener than those with hard roofs. Windmills are struck 52 times, and church and clock towers 39 times, oftener than ordinary houses with hard roofs. The marshy regions in Schleswig-Holstein are the most dangerous; and the land about inlets of the east coast the safest. With like conditions, the relative danger decreases the more houses are grouped together. In Baden the danger varies more than in any part of Germany (about Heidelberg it is 24, and in Waldshut 265 per million houses). In Hesse, the low plain of the middle Rhine is the most dangerous part. In the fifteen years 1869-83, there were killed by lightning for every million men, in Prussia, 4·4; in Baden, 3·8; in France, 3·1; and in Sweden, 3·0. The geological nature of the ground, and especially its capacity for water, has important influence. Thus, calling the danger on lime 1, that for sand is 9, while for loam it is 22. This is partly why most of South Germany and Austria is less dangerous than North Germany.

There are four factors affecting the lightning-danger to buildings; two physical—unequal frequency of storms, and geological character; and two social—variable population, and mode of building. Of all trees, oaks are most frequently damaged, beeches most rarely (in the ratio 54 to 1).

AN electric trumpet has been recently devised by M. Zigang (*La Nature*, June 4). It consists of a short brass tube mounted on wood and containing an electro-magnet whose ends face a vibrating plate, on which is fixed a small piece of soft iron. Against this plate-armature rests a regulating screw with platinum point, which serves for automatic interruption, by vibration of the armature. With two Leclanché elements a musical sound is had, which may be varied in pitch, intensity, and timbre by means of the screw. This instrument may be usefully employed in signalling on ships, railways, tramways, &c.; it may also serve as a receiver for signals of the Morse type.

PROF. CHRISTENSEN, of Copenhagen, has recently (*Journal für praktische Chemie*, 1887, No. 11) made a redetermination of the atomic weight of fluorine, with the satisfactory result that this element is to be added to the already large list of those whose atomic weights are whole numbers and simple multiples of that of hydrogen. The determination was based upon the analysis of a double fluoride of ammonia and manganese, $4NH_4F$ . $Mn_2F6$, the extreme precautions displayed in the preparation and purification of which show the peculiar difficulties attending work upon this singular element. It is very interesting to read of the filtrations through platinum gauze placed in gutta-percha funnels, of the drying of the beautifully crystalline red salt spread out upon wide expanses of platinum-foil, and of the skilful manner in which all traces of silicon were eventually eliminated. The results of the numerous analyses show that, if Stas's value for oxygen be taken as the standard, the atomic weight of fluorine is 18·94, but if, as Mendelejeff concludes, oxygen be 16, then the atomic weight of fluorine becomes 18·99, or, in round numbers, 19·0.

IT will probably be remembered that, early in the year 1883 (*Ber. der Deut. Chem. Ges.*, xvi. 324), a number of chemical reactions, especially the formation of arsenides from mixtures of metals and arsenic, were brought about, by Dr. W. Spring, by subjecting the powdered mixtures to the immense pressure of 6000 atmospheres. A still more striking experiment, entirely unique in its way, has just been made by Dr. Spring, in conjunction with Dr. Van't Hoff (*Zeitschrift für physikalische Chemie*, i. 5). In the course of a study of chemical dynamics these workers found that the blue-coloured double acetate of copper and calcium, $(C_2H_3O_2)_4CaCu$ . $8H_2O$, is perfectly stable at atmospheric pressure as far as 75°; above this temperature it is decomposed into its constituent acetates, three-quarters of its water of crystallization being set free. This decomposition is atended with contraction in volume, and the salts dissolve in the liberated water. The idea was at once suggested, Could this decomposition be effected by means of Dr. Spring's powerful compressing machinery? The idea was carried out, and no sooner was the pressure upon the solid double acetate increased to 7000 atmospheres, at a temperature of 40°, than the solution of the separated constituent salts spurted from every joint of the apparatus, and on releasing the pressure the resolidified mass was found to consist of a mixture of the white calcium and the green copper salt.

LAST week we referred to the fact that the Council of the Meteorological Society are anxious to obtain photographs of flashes of lightning. The *Photographic News*, dealing with the conditions under which such photographs should be taken, notes the following points as important:—"First, the exact position of the camera. In many countries, ordnance maps can be obtained on such a scale that a minute dot will indicate the position of the camera within a foot or two, and it will often be easy to record the position of the apparatus with far greater exactness, as, for example, when the camera is placed at a window. A thread with a plummet should be allowed to range from the optical centre (say the diaphragm in case of a doublet) to the floor, where a mark should be made. Second, the time at which the exposure was made. Third, the aspect of the camera. When the locality is exactly recorded, this datum may be approximate, as there will generally be the means of exactly determining it upon the plate itself. Fourth, the equivalent focus of the lens, but the determination of this may well be left until it it is found that something valuable may be deduced from the photograph. Fifth, the distance of the flash. The recording of this is a very important matter, as, when the focus of the lens is known, it will be easy to determine the actual distance between cloud and earth, also the horizontal angle subtended to the observer at the camera. To determine the distance, the observer should note as accurately as possible the time elapsing between the flash and the report, and in doing this, even such a chronograph watch as may now be had for five or six pounds will be found of great service."

AT a meeting of the Middlesex Natural History and Science Society, at the Natural History Museum, South Kensington, on the 11th inst., Prof. W. H. Flower, F.R.S., gave an address on the teeth of the Mammalia, especially referring to those specimens exhibited in the case in the Index Museum. Details of the structure, growth, and disposition of the teeth in the jaw were given, and the peculiarities of vestigial and rudimentary teeth pointed out. Prof. Flower referred to the value of these index museums, calling special attention to that of mineralogy, arranged by Mr. Lazarus Fletcher, and which for greater convenience was placed in the mineral gallery.

THIS evening, Prof. A. W. Williamson will deliver an address, in the Chemical Theatre, to the London University College Chemical and Physical Society. He has chosen as his subject, "Atomic Motion." Sir Henry Roscoe will take the chair.

"MY Microscope, and Some Objects from My Cabinet," a simple introduction to the study of "the infinitely little," by a Quekett Club man, is announced for immediate publication by Messrs. Roper and Drowley. The little volume is dedicated to the President and Members of the Quekett Microscopical Club.

MESSRS. WHITTAKER AND CO. will publish early next week Mr. E. C. Robin's book on "The Design and Construction of Applied Science and Art Buildings, and their Suitable Fittings and Sanitation."

THE Thuringian Fisheries Union held their tenth meeting at Jena on May 26. One of the members stated that 64,000 young salmon had been placed in the Saale last year. The Grand Duke of Saxe-Weimar was present at the meeting, and took part in the debates.

DR. MORITZ WAGNER, Professor at the Munich University, died at Munich on May 31. He was well known as a scientific traveller, and author of some excellent works of travel.

DURING the five months ended May 1887 the total value of the fish landed on the east coast of Scotland was £335,366; on the west coast, £75,290; in Orkney and Shetland, £34,516; the total value for five months being £445,172. As compared with the corresponding period of last year, this was a decrease of £4,113. The last month, however, showed an increase of £6,478 over the corresponding month of the year 1886.

ARTIFICIAL clouds for the protection of vines from frost were produced in a vineyard at Pagny on the Franco-German frontier during the night of May 13. About 3 a.m., when the thermometer had gone down to − 1°·5 C., the signal was given to ignite liquid tar, which had been poured into tin boxes, and pieces of solid tar which had been placed in the ground near the vines. Large clouds of smoke quickly enveloped the vineyard. The fires lasted for about two hours, but the smoke did not clear off till a considerable time after. The object of the experiment was completely gained, as not one young shoot was destroyed by the frost.

THE American Institute of Electrical Engineers, organized three years ago, is making arrangements for the purchase of a suitable building in New York. It is proposed that there shall be an electrical library and museum, and, if space permits, an experimental laboratory. Suitable accommodation will be provided for council and general meetings, and the entertainment of members and their guests, and the house will be open "at all reasonable hours."

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysothrix sciurea*) from Guiana, presented by Miss Grace Williams; a Negro Tamarin (*Midas ursulus*) from Guiana, presented by Miss Julia Neilson; a Rhesus Monkey (*Macacus rhesus*) from India, presented by Miss R. M. Hurt; a Common Marmoset (*Hapale jacchus*) from South-East Brazil, presented by Mrs. Constance Hoendorff; a Common Raccoon (*Procyon lotor*) from North America, presented by Mr. G. F. Van Zandt; two Lanner Falcons (*Falco lanarius*), European, presented by Mr. William Thomson; two Scaly Ground Doves (*Scardafella squamosa*) from Brazil, presented by Mr. William de Castro; a Cockateel (*Calopsitta novæ-hollandiæ*) from Australia, presented by Mr. H. H. James; a Ring-necked Parrakeet (*Palæornis torquatus*) from India, presented by Mrs. Hill; a Yellow-billed Sheathbill (*Chionis alba*) from Cape Town, presented by Mr. R. C. Ashton; nine Barbary Turtle Doves (*Turtur risorius*) from Africa, presented by Mr. E. L. Armbrecht; a Red Brocket (*Cariacus rufus*), a Great American Egret (*Ardea egretta*) from Brazil, deposited; three Sandwich Island Geese (*Bernicla sandvicensis*) from the Sandwich Islands, a Wryneck (*Iyyx torquilla*), European, purchased; a Wapiti Deer (*Cervus canadensis*), a Barbary Wild Sheep (*Ovis tragelaphus*), a Variegated Sheldrake (*Tadorna variegata*), nine Summer Ducks (*Æx sponsa*) bred in the Gardens.

## OUR ASTRONOMICAL COLUMN.

THE GREAT SOUTHERN COMET (1887 *a*).—Dr. J. M. Thome, of the Cordoba Observatory, has published in the *Astronomical Journal*, No. 156, some interesting particulars as to the appearance and observed positions of the great comet which he discovered on January 18. On the 21st it became evident that the comet was, in effect, all tail, the head being much the fainter part of the object, and being at least 15′ in diameter, very thin, and without nucleus or condensation of any kind. After various attempts at determining its co-ordinates, Dr. Thome adopted the plan of moving the telescope along the axis of the tail, until reaching a point beyond which nothing of a nebulous character could be distinguished, and determining its position. These points were approximately half a degree in advance of the true centre of the nebulosity, and nearly in its axis. The observations of position extend from January 21 to January 27. With regard to the appearance of the comet to the naked eye, Dr. Thome remarks that it was a beautiful sight—a narrow, straight, sharply-defined, graceful tail, over 40° long, shining with a soft starry light against the dark sky, beginning apparently without a head, and gradually widening and fading as it extended upwards.

The same number of the *Astronomical Journal* contains a discussion of the orbit of the comet by Mr. S. C. Chandler, Jun. The observations extend from January 20 to 29, and were made at Melbourne, Cordoba, the Cape, and Windsor, N.S.W. Two sets of elements—which do not materially differ, considering the extreme uncertainty of the observations—have been obtained; the first by taking the Cordoba observations as they stand, the second by attempting to determine the true centre of the nebulosity from Dr. Thome's statement that the recorded positions are 30′ in advance of the true centre and nearly in its axis. The elements are:—

| | I. | II. |
|---|---|---|
| T (G.M.T.) | 1887 Jan. 9·080 | Jan. 8·730 |
| | ° ′ | ° ′ |
| $\omega$ ... | 173 36·2 ... | 174 48·6 |
| ☊ ... | 130 46·2 ... | 132 48·6 |
| $i$ ... | 61 48·9 ... | 57 52·1 |
| log $q$ ... | 8·30484 ... | 8·36280 |

Mr. Chandler points out that these elements are very unlike those of comet 1880 I., with which this comet was at first associated. In fact the orbit found resembles more those assigned to the comets of 1680 and 1689, than that of the group 1843–80–82.

NEW MINOR PLANETS.—A new minor planet, No. 267, was discovered by M. Charlois at Nice on May 27. Another, No. 268, was discovered by M. Borelly at Marseilles on June 9.

## ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 JUNE 19–25.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

*At Greenwich on June* 19.

Sun rises, 3h. 44m.; souths, 12h. 0m. 58·8s.; sets, 20h. 17m.; decl. on meridian, 23° 26′ N.: Sidereal Time at Sunset, 14h. 8m.

Moon (New on June 21) rises, 2h. 48m.; souths, 10h. 20m.; sets, 18h. 1m.; decl. on meridian, 15° 57′ N.

| Planet. | Rises. | Souths. | Sets. | Decl. on meridian. |
|---|---|---|---|---|
| | h. m. | h. m. | h. m. | ° ′ |
| Mercury ... | ... 5 21 | ... 13 39 | ... 21 57 | ... 23 39 N. |
| Venus ... | ... 7 21 | ... 15 9 | ... 22 57 | ... 19 11 N. |
| Mars ... | ... 2 50 | ... 11 2 | ... 19 14 | ... 22 50 N. |
| Jupiter... | ... 14 28 | ... 19 47 | ... 1 6* | ... 8 50 S. |
| Saturn... | ... 5 43 | ... 13 47 | ... 21 51 | ... 21 41 N. |

* Indicates that the setting is that of the following morning.

| June. | h. | |
|---|---|---|
| 21 ... | 18 ... | Sun at greatest declination north; longest day in northern latitudes. |
| 23 ... | 5 ... | Saturn in conjunction with and 2° 26′ north of the Moon. |
| 23 ... | 10 ... | Mercury in conjunction with and 3° 27′ north of the Moon. |
| 23 ... | 19 ... | Jupiter stationary. |
| 25 ... | 0 ... | Venus in conjunction with and 2° 1′ north of the Moon. |

*Variable Stars.*

| Star. | R.A. | Decl. | | | |
|---|---|---|---|---|---|
| | h. m. | ° ′ | | h. m. | |
| U Cephei ... | ... 0 52·3 | ... 81 16 N. | ... June 23, | 0 14 | *m* |
| R Virginis ... | ... 12 32·8 | ... 7 37 N. | ... ,, 21, | | *M* |
| δ Libræ ... | ... 14 54·9 | .. 8 4 S. | ... ,, 25, | 1 0 | *m* |
| U Ophiuchi... | ... 17 10·8 | ... 1 20 N. | ... ,, 20, | 1 46 | *m* |
| | | | and at intervals of | 20 8 | |
| W Sagittarii | ... 17 57·8 | ... 29 35 S. | ... June 25, | 2 0 | *m* |
| U Sagittarii... | ... 18 25·2 | ... 19 12 S. | ... ,, 25, | 1 0 | *m* |
| η Aquilæ ... | ... 19 46·7 | ... 0 43 N. | ... ,, 20, | 1 0 | *M* |
| S Sagittæ ... | ... 19 50·9 | ... 16 20 N. | ... ,, 24, | 23 0 | *m* |
| R Capricorni | ... 20 5·0 | ... 14 36 S. | ... ,, 23, | | *M* |
| δ Cephei ... | ... 22 25·0 | ... 57 50 N. | ... ,, 21, | 23 0 | *m* |

*M* signifies maximum; *m* minimum.

*Meteor-Showers.*

| | R.A. | Decl. |
|---|---|---|
| Near β Ursæ Majoris ... | 168° ... ... | 55° N. |
| α Cephei ... ... ... | 315 ... ... | 60 N. |

## GEOGRAPHICAL NOTES.

EMIN PASHA contributes to the Scottish Geographical Society's Journal an account of an exploration he made recently of part of Lake Albert Nyanza, which contains some data bearing on the probable origin and the physical geography of